

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

- ☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)
- ☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE May 4, 1992	APPLICATION NUMBER G2-28489	PERMIT NUMBER	CERTIFICATE NUMBER
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NAME Weyerhaeuser/Vicwood Partnership			
ADDRESS (STREET) Meridian Campus WRE-11	(CITY) Tacoma	(STATE) Washington	(ZIP CODE) 98477

PUBLIC WATERS TO BE APPROPRIATED

SOURCE Two Wells		
TRIBUTARY OF (IF SURFACE WATERS)		
MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE 750	MAXIMUM ACRE FEET PER YEAR 187.32
QUANTITY, TYPE OF USE, PERIOD OF USE 187.32 Acre-feet per year	Irrigation (173 Acres)	April 1 to October 31

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION-WITHDRAWAL
Well 1: 200 feet South and 175 feet East of the center of Section 36.
Well 2: 800 feet South and 25 feet East of the center of Section 36.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION) NW¼ SE¼	SECTION 36	TOWNSHIP N. 19	RANGE, (E. OR W.) W.M. 1W	W.R.I.A. 13	COUNTY Thurston
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RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
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LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Section 36, T 19 N., R. 1 W.W.M., LESS the following described parcels: (1) The North 400 feet of the East 400 feet of Section 36, T. 19 N., R. 1 W.W.M.; EXCEPTING therefrom the North and East 30 feet for County roads. (2) That portion of the Northwest quarter of Northeast quarter (NW¼ of NE¼) of Section 36, T. 19 N., R. 1 W.W.M. described as follows: Commencing at the Northwest corner of said NW¼ of NE¼; thence East along the North line thereof 879.20 feet; thence South 30 feet to a point on the South boundary of the Luhr Beach County Road, as described in a Dedication Deed, dated March 29, 1948, recorded in Volume 228 at Page 616, Records of Thurston County, said point being the true point of beginning of the tract hereby conveyed; thence East, along said South boundary, 200 feet; thence South 200 feet; thence North 200 feet, more or less to the true point of beginning. Section 1, T. 18 N., R. 1 W.W.M., LESS the following described parcels: (1) That part of the Southwest quarter of the Northwest quarter of Section 1, T. 18 N., R. 1 W.W.M., lying Southerly of the county road known as Old Hogum Bay Road; (2) The North half of the Northeast quarter of Section 1, T. 18 N., R. 1 W.W.M. (3) The Southeast quarter of the Northeast quarter of Section 1, T. 18 N., R. 1 W.W.M. (4) That portion of Southeast quarter of the Southeast quarter of Section 1, T. 18 N., R. 1 W.W.M., lying Easterly of county road known as Meridian Road relocation. Section 2, T. 18 N., R. 1 W.W.M., described as follows: The South half of the Southeast quarter of the Southeast quarter of said Section 2.

DESCRIPTION OF PROPOSED WORKS

Well 1: 8" X 309' yield 450 gpm
Well 2: 10" X 293' yield 300 gpm
Groundwater discharging to man made ponds, then distributed throughout golf course.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE: Started	COMPLETE PROJECT BY THIS DATE: Completed	WATER PUT TO FULL USE BY THIS DATE: June 1, 2001
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REPORT

BACKGROUND:

Under the provisions of Chapters 90.03 and 90.44 Revised Code of Washington (RCW) Weyerhaeuser/Vicwood Partnership of Tacoma, Washington filed an application to withdraw ground water. The amount initially requested was 1,000 gallons per minute (gpm) for irrigation of a golf course. The application was assigned No. G2-28489 and given a priority date of May 4, 1992.

Legal notice was published as required. No protests or objections were received as a result of the public notice.

I recommend issuance of a permit based on the following report of examination.

INVESTIGATION:

In consideration of this application I conducted field visits on November 13, 1995 and in June 1997. In addition, I evaluated information submitted with the application and reviewed relevant documents including water-well reports in the project area, recorded water rights, registered claims, hydrogeologic studies, Chapters 173-511 and 173-513 WAC, and consulted with Ecology Water Resource hydrogeologists.

Location of Project Site

The project site is the Meridian Campus planned residential development's Meriwood Golf Course, located in north Thurston County, in the Hawks Prairie area. Site elevation is approximately 250 feet above sea level. The project site is approximately 1.5 miles south of Puget Sound/Hogum Bay and one mile west of the mouth of McAllister Creek and the Nisqually Reach. The surface topography slopes to the north/northeast toward Puget Sound. Surrounding land use includes housing developments, single family homes, small farms, commercial supply retailers, and light industrial uses.

System Description

	Meriwood Well ID No. ABH211	Meriwood Well ID No. ABH327
Completed Depth (ft below ground surface)	309	293
Completed Elevation (ft below sea level)	59	43
Casing Diameter (in)	10/8	10/8
Water Level Elevation (ft above sea level)	32 (12/95)	29 (04/94)
Screen Interval Depth (ft bgs)	287-309	273-293
Yield (gpm)	450	300

Two wells were constructed in March 1994, both within the NW1/4 SE1/4 of Section 36, Township 19 N., Range 1 W.W.M. They have been tested in accordance with preliminary permit authorization. A computer-controlled irrigation system has been installed to accurately manage water application on the golf course. Subsequently, the amount requested has been reduced to 750 gpm.

Ground water will be withdrawn from the wells and distributed to man-made ponds. The ponds will be constructed below grade and used as storage reservoirs in the northernmost half of Section 36. Booster pumps drawing water from the ponds will pressurize irrigation mains for water distribution on the golf course.

Aquifer Characteristics

The two production wells appear to be completed within the "Sea Level" aquifer, which lies stratigraphically below the Vashon Drift and the Kitsap Formation, respectively. It comprises permeable deposits of pre-Vashon glacial material. In the project area, the direction of ground water flow in the Sea Level aquifer is generally east and northeast to points of discharge below sea level under the Nisqually River Delta and the Nisqually Reach.

Rongey/Associates conducted a hydrogeologic investigation for the Meridian Campus development. (Hydrogeologic Investigation, Meridian Campus Development May 1997, Rongey/Associates, Hydrogeology). The completed report of the investigation was submitted to Ecology in May 1997. The study area extends from I-5 north to Tolmie Park. The summary and conclusions of the investigation states in part that:

- Between October and March, the Sea Level aquifer receives 6,700 acre-feet of recharge during average recharge years, 9,000 acre-feet during surplus recharge years and 4,300 acre-feet during extreme deficit recharge years.
- Most of the recharge to the Sea Level aquifer in the project area is localized. Only roughly 13 percent of the total recharge is estimated to enter the Sea Level aquifer as subflow from the south. Precipitation within the study area infiltrates first into the two shallow aquifers above the Kitsap Formation, then migrates downward. Roughly 35 percent migrates outward to the peripheral springs above the Kitsap Formation and 65 percent migrates downward to the Sea Level aquifer through erosional windows in the Kitsap Formation.
- The total current estimated amount of pumping withdrawal from the Sea Level aquifer within the study area is approximately 320 acre feet per year (af/y), of which 140 af/y, or 44 percent, is presently being withdrawn by the Meriwood wells under temporary authorization. Meriwood is requesting a maximum withdrawal of 187.32 af/y under this filing, which is approximately 4 percent of the recharge for an extreme deficit year.

Report Continued

Sea Water Intrusion

The Sea Level aquifer is at and/or below sea level and is hydraulically connected to Puget Sound. The maximum tidal fluctuation observed during this study in well 36L01, located 5000 feet from tidewater, was 0.8 feet. Static water levels in both wells 36L01 (+32 ft) and 36L02 (+29 ft) are above sea level. Pumping is expected to cause a decline of roughly 20 feet in wells L01 and L02. There could be minimal interference with well 01A01 at the White Firs Development, but not enough to induce seawater intrusion. Seawater intrusion has not been a problem in the area in the past. Elevated chloride levels have been observed in the Sea Level aquifer roughly one mile southwest of the Meriwood wells (Olympia Cheese Company, Classic Heights, and White Firs; 18N/01W -02G01, -01A01, -02H02; 9-54 mg/l chloride), but this is probably attributable to increased pH from the wastewater stream at the Olympia Cheese Company.

Water levels in the Meriwood wells should not be allowed to fall below sea level, so as not to induce seawater intrusion. If this occurs, the pumping schedule must be altered to mitigate the effect. The Meriwood wells should also be monitored twice a year for chloride concentrations. Water level declines and chloride concentrations in Sea Level aquifer wells of senior water right holders in the vicinity of the Meriwood wells also need to be taken into consideration.

Other Considerations

Withdrawal of ground water from the Sea Level aquifer in the project area could possibly affect base flow to McAllister Creek, but the effect will most likely not be measurable. The effect would also manifest itself in the tidally-influenced portion of McAllister Creek, near the mouth, where base flow is not a crucial factor in maintaining instream flows.

Existing Water Rights

Based on the information presented and evaluated for this project, existing water rights will not be adversely affected.

The following recorded-water rights, permits, registered claims, and water-well reports are on file with Ecology within a one-mile radius of the subject site:

- Thirty ground-water right certificates have been issued authorizing a combined instantaneous withdrawal of 2,299 gpm, 1,415.8 af/y. Water is used for single and multiple domestic supply, irrigation, commercial, industrial, fish propagation, and wildlife enhancement.
- Presently there are four ground-water permits that are within their development schedules to put the waters to beneficial use prior to issuance of certificates. The combined (anticipated) instantaneous withdrawals amount to 2,800 gpm, 1,839.5 af/y. These permits authorize the development of water to serve multiple and municipal supplies, and irrigation of a golf course.
- Five surface-water right certificates have been issued authorizing a combined instantaneous diversion rate of 1.35 cubic feet per second, 4 af/y. Water is used for single and multiple domestic supply, and fish and wildlife propagation.
- Forty-nine registered water right claims are on file that may be within a one-mile radius of the subject well. The majority of claimed use is for domestic supply from wells.
- Forty-eight water-well reports are on file with Ecology within a one-mile radius of the subject well. Depths of wells in the vicinity range from 44 to 667 feet below ground surface.

Water Conservation Plan for the Meriwood Golf Course

The conservation plan implemented at the Meriwood Golf Course is a computer-controlled system with an integrated weather station allowing for maximum monitoring and control of water usage. There are four main components:

1. The sprinkler heads used are electronically operated for the quickest start-up and shut down time, eliminating any waste of water. The variety of nozzles allows the operator to use the most efficient precipitation rate for a given area.
2. Satellite controllers within the system operate on a standalone basis or can be controlled by the computer.
3. The weather station is a vital link between the computer, operator and actual water usage. Six weather parameters are monitored including air temperature, solar radiation, humidity, wind speed, wind direction and rainfall. Data is collected hourly and can store up to seven days of information. The data is calculated and converted into an evapotranspiration value, which is used by the computer or operator to determine distribution.
4. The computer controller within the system is designed with water conservation as a high priority. The system helps calculate the soils current reservoir capacity and combines input from the weather station and operator to project the most efficient use of water.

Water used to irrigate the golf course will come from two primary sources. One is storm water runoff that is routed and retained in holding ponds. Efforts will be made to maximize use of the ponds. During drier months the storm water ponds will be insufficient and will need to be supplemented with groundwater. A maximum withdrawal will be 750 gpm.

Turf used on golf courses today, are genetically engineered with drought resistance in mind. Actual water usage will be monitored in two ways. A meter has been installed on each well and the use recorded weekly. Static water levels are also measured weekly, after the well has not been pumped for a period of 12 hours.

Water Requirements

Water requirements on the Meriwood site will vary with precipitation rates for any given year, however based on average rainfall and evapotranspiration rates in the Thurston County area the following monthly requirements are approximated:

<u>Month</u>	<u>Acre-feet</u>
April	5.00
May	19.8
June	34.98
July	60.72

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August	45.98
September	15.84
October	5.00
Total	187.32

Calculations are based on 3.5 acres in greens, 153.6 acres in fairways, roughs, tees and practice range, plus 10 percent, amounting to a total of approximately 173.0 acres.

The conservation plan and water requirements, outlined above, were prepared by Joseph J.F. Roloff of Grow-In Specialties.

FINDINGS AND CONCLUSIONS:

Based upon the above investigation, the Department of Ecology finds the following:

1. Proposed use of water is a beneficial use of water.
2. The source of water requested is not in hydraulic continuity with the Deschutes River, its tributaries, or with the Nisqually River.
3. Water is available for appropriation.
4. The proposed appropriation will not be detrimental to public welfare.
5. The proposed appropriation will not impair existing water rights.

RECOMMENDATIONS:

I recommend approval of this application and issuance of a permit to allow withdrawal of 750 gpm, 187.32 af/y for irrigation. The period of use shall be during the irrigation season as needed.

This report and subsequent permit shall issue subject to all applicable state regulations and the following provisions:

Provisions

Installation and maintenance of an access port as described in Chapter 173-160 is required. An air line and gauge may be installed in addition to the access port.

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, 90.44.450 and WAC 508-64-020 through -040, and WAC 508-12-030. Meter readings shall be recorded at least monthly.

A certificate of water right will not be issued until a final investigation is made.

Permittee or certificate holder and its successor(s) shall provide data on chloride concentrations for the well authorized by this permit or certificate with analysis performed by a state accredited laboratory. Accreditation information may be obtained from Ecology's Quality Assurance Program at (360) 895-4649. Sampling shall occur in April and August of each year, with a copy of the laboratory results for both sampling events submitted by October 15 of the same year, to the Department of Ecology, Southwest Regional Office, Olympia, Washington.

If pumping of the well authorized by this permit or certificate causes chloride concentrations to exceed 100 milligrams per liter, immediate action shall be required to prevent concentrations from increasing (such as reducing the instantaneous withdrawal rate (gpm) of the well). If corrective measures fail to prevent chloride concentrations from exceeding said level in the future; permittee or certificate holder shall relinquish the option to perfect additional allocated quantities regardless of the stage of development.

The Water Resources Act of 1971, Chapter 90-54 RCW specifies certain criteria regarding utilization and management of the waters of the State in the best public interest. Favorable consideration of this application has been based on sufficient waters available, at least during portions of the year. However, it is pointed out to the applicant that this use of water may be subject to regulation at certain times, based on the necessity to maintain water quantities sufficient for preservation of the natural environment.

A proof inspection will be conducted prior to final certificate issuance. The certificate will reflect the extent of the project perfected within the limitations of the permit. Aspects will include as appropriate the source(s), system instantaneous capacity, beneficial use(s), annual quantity, acreage, place of use, and satisfaction of provisions.

Water-pumpage, well-monitoring, and static-water-level data, along with a summary and analysis of the data, shall be submitted annually, or more frequently upon request, to Ecology's Southwest Regional Office Water Resources Program. The data shall be submitted in digital format (ASCII) and shall include the following elements:

For Water Use Reporting:

1. Measurement method (totaling meter, acoustic meter, etc.) for each well
2. Total volume pumped from each well by month in thousands or millions of gallons
3. Unique Well ID number

For Water Level Reporting:

1. Unique Well ID Number
2. Measurement date and time
3. Measurement method (air line, electric tape, pressure transducer, etc.)
4. Well status (pumping, recently pumped, etc.)
5. Water level accuracy (to nearest foot, tenth of foot, etc.)
6. Description of the measuring point (top of casing, sounding tube, etc.)
7. Measuring point elevation above or below land surface to the nearest 0.1 foot

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8. Land surface elevation at the well head to the nearest foot.
9. Static water level below measuring point to the nearest 0.1 foot.

For Water Quality Monitoring:

1. Unique Well ID Number
2. Sampling date and time
3. Chloride concentration (mg/L)
4. Submit paper copy of laboratory report

The applicant is advised that notice of Proof of Appropriation of water (under which the final certificate of water right is issued) should not be filed until the permanent distribution system has been constructed and that quantity of water allocated by the permit to the extent water is required, has been put to full beneficial use.

In accordance with Chapters 90.03 and 90.44 RCW, I find there is water available for appropriation from the source in question, that the appropriation as recommended is a beneficial use, and should not impair existing rights or be detrimental to public welfare.

REPORTED BY: Vicki Cline Date: May 14, 1999

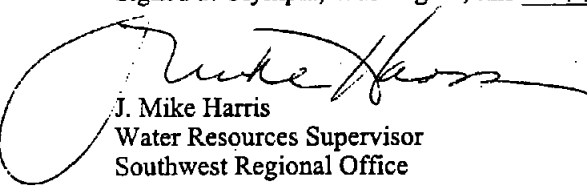
The statutory permit fee for this application is \$69.12.

FINDINGS OF FACT AND DECISION

Upon reviewing the above report, I find all facts, relevant and material to the subject application, have been thoroughly investigated. Furthermore, I find water is available for appropriation and the appropriation as recommended is a beneficial use and will not be detrimental to existing rights or the public welfare.

Therefore, I ORDER a permit be issued under Ground Water Application Number G2-28489, subject to existing rights and indicated provisions, to allow appropriation of public ground water for the amount and uses specified in the foregoing report.

Signed at Olympia, Washington, this 14th day of May, 1999.


J. Mike Harris
Water Resources Supervisor
Southwest Regional Office